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REMARKS

Rejections Under 35 USC § 103

Claims 1 and 3-15 were rejected under 35 USC §103(a) as being unpatentable over Stein *et al.*, EP 0 937 412 ("Stein") or Stein in view of Ford *et al.*, U.S. Patent No. 5,607,707[1] ("Ford"). (Paper No. 02122004 at 2.)

Stein discloses "a continuous process for the preparation of a pulverous carotenoid, retinoid or natural colourant preparation, wherein the active ingredient is finely divided ...." (Abstract). The process includes the steps of:

> a) forming a suspension of the active ingredient in a water-inmiscible organic solvent optionally containing an antioxidant and/or an oil,
> b) feeding the suspension of step a) to a heat exchanger and heating said suspension to 100-250°C, whereby the residence time in the heat exchanger is less than 5 sec,
> c) rapidly mixing the solution of step b) at a temperature in the range of 20-100°C with an aqueous solution of a swellable colloid optionally containing a stabilizer,
> d) removing the organic solvent and
> e) converting the dispersion of step d) into a pulverous preparation. (Col. 2, lines 3-16.)

The "finely divided" starting material is said to be of "a particle size of less than 1.5 micron, preferably less than 1 micron, more preferably less than 0.4 micron." (*Id.*, lines 18-21.) Stein further discloses that the "swellable colloid" can include gelatin, carbohydrates, dextrin, pectin, gun arabic, octenylbutanedioate amylodextrin, milk

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[1] We note that the Examiner consistently cited to "Ford et al (US 5,507,707)" in the Office Action. (See Paper No. 021222004 at 2 and 4.) This appears to be an error. US 5,507,707 was issued to Bruce Miller for an "Isokinetic Cervical Exercise Device." It is assumed that the Examiner intended to cite to Ford *et al.*, U.S. Patent No. 5,607,707, as in the previous Office Action.

proteins, and vegetable protein, or mixtures thereof. (Col. 3, lines 2-8.) Stein also discloses that powders formed from the compositions are soluble in cold water and provide coloration. (*See*, Examples 1-5.)

Ford discloses "[a]n aqueous composition for the preparation of optically clear products for use in human or animal healthcare comprising 0.1 to 2.0% w/w of an oil-soluble ingredient as a 20-30% w/w dispersion in a suitable oil or 0.1 to 5.0% w/v as the pure crystalline compound, 2-20% of an emulsifier having an HLB (hydrophilic/lipophilic balance) value of between 10 and 18 or where a blend of emulsifiers is employed, a calculated HLB value of between 10 and 18 and 0.1 to 1.0% of an antioxidant or a mixture of antioxidants." (Abstract.) Ford discloses that its compositions are "particularly useful" for producing optically clear products; but that the compositions may be used to produce opaque, cloudy materials as well. (Col. 3, lines 57-59.) Ford further discloses that a variety of other optional ingredients may be added to the compositions or the final food product, including "sweeteners, preservatives (*e.g.*, sulphur dioxide, benzoic acid and sorbic acid), proteins, fats, vitamins, minerals and other materials employed in the preparation of food and drink products." (Col. 4, lines 34-38.)

In making the rejection, the Examiner offered only a "RESPONSE" to the arguments provided in the Response to Office Action Including Amendment filed November 14, 2003 (Paper No. 13) (the "previous response"). (Paper No. 02122004 at 2-4.) Accordingly, the original rejection is summarized below. In the original rejection, the Examiner asserted that Stein discloses "powder compositions having carotenoids and antioxidants such as vitamin E dispersed in a matrix of gum arabic or gelatin at particle sizes of about 225 nm. The powders of [Stein] are soluble into beverages and

provide for administration of vitamins in this manner (i.e. beverages)." (Paper No. 13 at 4).

The Examiner relied on Ford as disclosing "optically clear beverages obtained when powder compositions having particles less than 650 nm are added." (*Id.*)

The Examiner then concluded that "a *prima facie* case of obviousness exists even though the claimed range and prior art do not overlap, because they are close enough that one skilled in the art would expect them to have the same properties (see MPEP 2144.05 *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773)." (*Id.*)

In the previous response, arguments demonstrating the legal and factual deficiencies of the rejection were presented. In the interest of economy, these arguments are incorporated by reference, but will not be reproduced herein. We simply note that the Examiner's "response" to these arguments provided only the "examiner's position" or an "obvious ... to optimize" standard, which add nothing substantive to fill the legal and factual gaps in the rejection. (Paper No. 02122004 at 2-4.) Accordingly, the previous arguments stand unrebutted and for those reasons alone the rejection should be withdrawn.

Notwithstanding the infirmities of the rejection noted above, in an effort to further prosecution, we submit herewith a Rule 132 declaration of Dr. Hermann Stein (the "Stein Declaration")(Exhibit A) showing that particles of the claimed size could not have been produced using the method of Stein. In the declaration, Dr. Stein, a co-inventor of the subject matter disclosed in Stein, states that he and his co-inventors

attempted to produce the smallest possible particle size. (Stein Declaration, ¶ 6.) The particles disclosed in Example 5 of Stein were the smallest particles that Dr. Stein and his co-inventors were able to produce at that time. (*Id.*, ¶¶ 6-7.)

According to Dr. Stein, one could not have predicted that the process of the claimed invention would produce significantly smaller particle sizes than the methods of Stein. (*Id.*, ¶ 8.) Moreover, Dr. Stein concludes, based on his knowledge of the compositions and methods of Stein and his experience in this area, that one of skill in the art at the time of the present invention familiar with the disclosure of Stein could not have produced particles of the size claimed. (*Id.*, ¶ 7.)

For these additional reasons, the rejection should be withdrawn.

Claims 1 and 7-15 were rejected under 35 USC §103(a) as being unpatentable over Tritsch *et al.*, EP 0 841 010 ("Tritsch '010") or Tritsch '010 in view of Ford. (Paper No. 01222004 at 4.)

Tritsch discloses "stable, cold water dispersible preparations of fat-soluble substances contain[ing] a microbially produced oil rich in arachidonic acid. These preparations are manufactured by preparing an aqueous emulsion of the microbially produced oil which has been stabilized with an antioxidant and fish gelatin and if desired converting this emulsion into a dry powder. The preparations in accordance with the invention can be used for human nutrition." (Abstract.) The pulverous preparation is made by preparing a matrix of fish gelatin and then emulsifying a single cell oil (SCO) rich in arachidonic acid stabilized with antioxidant in the gelatin. (Col. 1, lines 61-65.) The emulsion may be converted into a powder using a conventional process, *e.g.*, spray drying. (Col. 2, lines 27-30.) These preparations are disclosed to

be suitable for human nutrition, especially for neonates. (*Id.*, lines 38-39.) The average particle size of the internal phase of the emulsion is disclosed to be 180 nm or 200 nm. (*See*, Example 1, col. 2, line 53 and Example 2, col. 3, lines 1-2.) The antioxidant stabilizer for the oil phase may be tocopherol, an ascorbic acid ester, or a mixture thereof. (Col. 1, lines 37-40.)

Ford is summarized above.

In making the rejection, the Examiner, once again, merely responded to the arguments made in the previous response. (Paper No. 02122004 at 4-5.) Accordingly, the original rejection is summarized below. In the original rejection, the Examiner relied on Tritsch '010 as disclosing "powder compositions having vitamins dispersed in a matrix of gelatin at particle sizes of about 200 nm. The powders of [Tritsch] '010 are soluble into beverages and provide for administration of vitamins in this manner (i.e. beverages)." (Paper No. 13 at 4.)

The Examiner relied on Ford as disclosing "optically clear beverages obtained when powder compositions having particles less than 650 nm are added." (*Id.*)

The Examiner concluded that "a *prima facie* case of obviousness exists even though the claimed range and prior art do not overlap, because they are close enough that one skilled in the art would expect them to have the same properties (see MPEP 2144.05 *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773)." (*Id* at 4-5.)

In the previous response, arguments demonstrating the legal and factual deficiencies of the rejection were presented. In the interest of economy, these

arguments are incorporated by reference, but will not be reproduced herein. We simply note that the response to these arguments recites only that the "examiner believes" or an "absent showing any criticality ... one of an ordinary skill in the art would expect to appropriately choose" standard, which add nothing substantive to fill the legal and factual gaps in the rejection. (Paper No. 02122004 at 4-5.) Accordingly, the previous arguments stand unrebutted and for those reasons too, the rejection should be withdrawn.

Notwithstanding the infirmities of the rejection noted above, in an effort to further prosecution, we submit herewith a Rule 132 declaration of Dr. Chyi-Cheng Chen (the "Chen Declaration")(Exhibit B) showing that particles of the claimed size could not have been produced using the process of Tritsch. In the Declaration, Dr. Chen, a co-inventor of the present application, describes an experiment replicating Example 2 of Tritsch.

The data presented in the Chen Declaration show that the decrease in particle size from the Tritsch process to the claimed compositions is "statistically and commercially significant." (Chen Declaration, ¶15.) According to Dr. Chen, the Tritsch process yields particles of 282 nm. (*Id.*, ¶12 and Table 1.) Increasing the mixing time and/or mixing speed produced particles ranging in size from 247 nm to 272 nm. (*Id.*) Thus, the process of Tritsch produced particles that were from 206% to 352% of the size of the claimed particles. (*Id.*, ¶15.)

The change in particle size with increased mixing speed varied from an increase of 1.97% to a decrease of 12.4%. (*Id.*, ¶13 and Table 2.) Likewise, the change in particle size with increased mixing time varied from an increase of 6.48% to a

decrease of 9.93%. (*Id.*, ¶14 and Table 3.) Dr. Chen notes that increased mixing time and/or speed does not lead to a significant reduction in particle size, and in fact, does not consistently lead to any reduction in particle size. (*Id.*, ¶14.)

According to Dr. Chen, the Tritsch method cannot produce particles having an average diameter of about 80 to about 120 nm, as claimed. (*Id.*, ¶15.) Moreover, Dr. Chen concludes, based on the objective evidence, as well as his knowledge and experience in this area, that one of skill in the art would not have expected, using the disclosure of Tritsch, to produce compositions having the claimed size. (*Id.*, ¶16.)

For these additional reasons, the rejection should be withdrawn.

Claim 17 was rejected under 35 USC § 103(a) as being unpatentable over Stein or Tritsch '010 each alone or in combination with Ford in view of Finnan *et al.*, U.S. Patent No. 4,830,859 ("Finnan"). (Paper No. 02122004 at 5.)

Stein, Tritsch, and Ford are summarized above.

Finnan discloses "a process for preparing lubricated water-soluble vitamin powder ... [which] is directly compressible into tablets." (Col. 1, lines 10-15.)

In making the rejection, the Examiner merely responded to the arguments made the previous response. (Paper No. 02122004 at 5.) Accordingly, the original rejection is summarized below. In the original rejection, the Examiner relied on his previous characterization of Stein, Tritsch, and Ford. (Paper No. 13 at 5.)

The Examiner acknowledged, however, that "[n]one of these teaches incorporating the powder into tablets." (*Id.*) To fill the acknowledged gap, the Examiner relied on Finnan as disclosing "formation of vitamin powder into tablets." (*Id.*)

The Examiner then summarily concluded "it would have been obvious ... to form the powder into tablets with the motivation of providing a convenient dosage form for administration of a vitamin." (*Id.*)

In the previous response, arguments demonstrating the legal and factual deficiencies of the rejection were presented. In the interest of economy, these arguments are incorporated by reference, but will not be reproduced herein. We simply note that the Examiner's "response" to these arguments is that the Examiner "maintains the position as explained above" with respect to Stein and Ford.[2] (Paper No. 02122004 at 5.) As noted above, none of these "positions" closes the legal and factual gaps in the rejection. In addition, the Examiner employs an "it would have been within the scope of a skilled artisan to prepare" standard, which also adds nothing substantive to fill the legal and factual gaps in the rejection. (*Id.*) Accordingly, as with the other rejections, the previous arguments stand unrebutted and for those reasons alone the rejection should be withdrawn.

Notwithstanding the infirmities of the rejection noted above, in an effort to further prosecution, the Stein and Chen Declarations have been submitted (*supra*). As demonstrated in the Stein Declaration, the process of Stein could not have produced particles of the claimed size. (Stein Declaration, ¶7.) Moreover, in Dr. Stein's opinion, one could not have predicted that the present invention would produce significantly smaller particle sizes than the Stein method. (*Id.*, ¶8.) As demonstrated in the Chen Declaration, the process of Tritsch could not have produced particles having an average size of about 80 to about 120 nm, as claimed. (Chen Declaration, ¶15.) In

[2] The Examiner fails to even acknowledge the arguments as to Tritsch or Tritsch in combination with Ford in view of Finnan.

addition, in Dr. Chen's opinion, one would not have expected, using the disclosure of Tritsch, to produce compositions having particles of the claimed size. (*Id.*, ¶16.)

Thus, the two primary documents relied on by the Examiner have been negated and neither Ford nor Finnan can fill the factual void left by the absence of Stein and Tritsch.

For these additional reasons, the rejection should be withdrawn.

Obviousness-type Double Patenting Rejection:

Claims 1, 3-6, 10-15, and 17 were "rejected under the judicially created doctrine of obviousness-type double patenting ... over claims 1-32 of U.S. Patent No. 6,162,474" in the previous Office Action. (Paper No. 13 at 6.) This rejection has been maintained. (Paper No. 02122004 at 5.) While not agreeing with the Examiner's position with respect to the double patenting rejection, to advance prosecution, should the § 103 rejections be withdrawn and the only rejection remaining be the obviousness-type double patenting rejection, a terminal disclaimer will be filed.

Accordingly, for the reasons set forth above, consideration of the declarations, withdrawal of the rejections, and allowance of the claims are respectfully requested. If the Examiner has any questions regarding this paper, please contact the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on March 24, 2005.

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Respectfully submitted,

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